

U.S. NAVAL BASE, PEARL HARBOR, FORD ISLAND 5-INCH  
ANTI-AIRCRAFT BATTERY, EAST GUN EMPLACEMENT  
(U.S. Naval Base, Pearl Harbor, Naval Station Ford Island)  
(Battery No. 7, Oahu 5-Inch Naval Anti-aircraft Shore Batteries)  
Pearl Harbor  
Honolulu County  
Hawaii

HAER No. HI-85-B

BLACK & WHITE PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD  
U.S. Department of the Interior  
National Park Service  
Oakland, California

## **HISTORIC AMERICAN ENGINEERING RECORD**

U.S. NAVAL BASE, PEARL HARBOR,  
FORD ISLAND 5-INCH ANTI-AIRCRAFT BATTERY, EAST GUN EMPLACEMENT  
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**Location:** Ford Island  
Pearl Harbor National Historic Landmark  
City and County of Honolulu, Hawaii

USGS 7.5 minute series topographic map, Pearl Harbor, HI, 1999.  
Universal Transverse Mercator (UTM) coordinates:  
04.608410.2363090.

**Date of Construction:** 1942-1943

**Designer:** Honolulu District Engineer, U.S. Army Corps of Engineers.

**Builder:** Navy provided initial construction work force – personnel from vessels damaged in the Pearl Harbor attack. Battery was completed by Honolulu District Engineer, U.S. Army Corps of Engineers.

**Owner:** United States Navy

**Present Use:** Abandoned, re-covered with earth.

**Significance:** This antiaircraft battery gun emplacement and its battery command center are associated with the hasty construction of nine 5-inch antiaircraft defensive positions in the months after the 7 December 1941 Japanese attack on Pearl Harbor when an invasion of Oahu was thought to be imminent. Some of the 5-inch guns and gun directors used in the batteries were salvaged from ships damaged and/or sunk during the attack, possibly including the 5-inch guns of this battery.

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## DESCRIPTION

During excavations for utility lines associated with new housing on Ford Island, which lies within the Pearl Harbor National Historic Landmark, the remains of three structures (one command center and two gun emplacements for 5-inch<sup>1</sup> antiaircraft guns) were unearthed. These three structures comprise a portion of an antiaircraft battery, one of nine that were constructed during the months after the Pearl Harbor attack. Some of these antiaircraft shore batteries used 5-inch guns that were salvaged from Navy ships damaged or sunk during the attack. The three structures were discovered at the north end of Ford Island. The roads in this portion of the island have been altered numerous times in recent years. These structures were unearthed at a location approximately 500' east of the current traffic circle at the intersection of Ford Island, Chaffee, and O'Kane Boulevards. They had been covered by about three to four feet of overburden. The surface above the three structures had recently been paved or planted with landscaping, due to the construction of a different traffic circle, around the time of the opening of the Admiral Clarey Bridge in April 1998.

For descriptions of the other structures unearthed, see their associated HAER reports:

HAER HI-85-A, U.S. Naval Base, Pearl Harbor, Ford Island 5-Inch Antiaircraft Battery, Command Center.

HAER HI-85-C, U.S. Naval Base, Pearl Harbor, Ford Island 5-Inch Antiaircraft Battery, South Gun Emplacement.

For historical context information on this antiaircraft battery see the overview report:

HAER HI-85, U.S. Naval Base, Pearl Harbor, Ford Island 5-Inch Antiaircraft Battery

The east gun emplacement is located about 93'-6" east of its battery command center, and about 112' northeast of the south gun emplacement. The east gun emplacement has an irregularly shaped footprint with overall dimensions of about 28' x 30'. The structure is centered on a concrete block (gun block), 14'-6" square. Around the gun block is a 4" thick concrete slab with the remains of retaining walls at most of its irregularly shaped perimeter.

The gun block, imbedded in the earth to secure the gun during firing, was the largest feature of the 5-inch anti-aircraft gun emplacement. Such gun blocks were noted as approximately "15 feet square and four and one-half feet deep, weighing some 76 tons."<sup>2</sup> The gun block at the east gun emplacement is surrounded by the 4" thick concrete slab and was not excavated to discern its actual depth.

On top of the gun block a table-like feature of cast concrete was built; it is basically rectangular in plan with a projecting arm along the west long side. Its axes are skewed from the right angles of the square gun block. The rectangular portion of the concrete "table" has dimensions of

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<sup>1</sup> Navy guns are designated by their bore diameters. Because this term is used a type description, it is written as 5-inch, rather than using the quotation marks (5") employed for measurements in inches.

<sup>2</sup> John D. Bennett, "Oahu's World War Two 5-Inch Naval Antiaircraft Shore Batteries," *The Coast Defense Journal* (February 2007), 37.

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14'-8" x 7'-1". The 2'-2" wide arm projects 3'-4" from near the mid-point of its western long side. This block of concrete feature originally was symmetrical along its long axis; it had another 2'-2" wide arm projecting 3'-4" from its east side. This east arm was broken off and removed from the gun emplacement during excavation. It was discovered in the rubble heap of fill removed from the east gun emplacement. All the vertical corners of this concrete feature (that portion in situ and the separate arm) are beveled about 4". The top surface of the rectangular section and arm is about 2'-4" above the top of the gun block. Three groups of  $\frac{3}{4}$ " rods, four rods per group, are imbedded in the top surface of the concrete feature. Each group of four rods is arranged in a rough rectangle with typical dimensions of 7" x 4". Some of the rods are threaded at the ends. Typically the rods are cut flush with the surface or protrude several inches and bent over. The groups of rods are located near the mid-points of the short sides of the rectangular section and near the mid-point of the arm, at varying distances of 8" to 1'-1" from the edges.

The spalled area on the east side of this cast concrete feature, where the east arm was broken off, reveals two  $1\frac{3}{4}$ " bolts imbedded in the concrete gun block below and protruding up about 7" from the top surface of the gun block.<sup>3</sup> The bolts are set with 6" spacing, center-to-center, and are positioned 4'-8" away from and parallel to the edge of the gun block. Although only two bolts are observable at this gun position, their configuration on the concrete gun block is consistent with the extant mounting bolt pattern at the adjacent gun position, the south gun emplacement (See HAER HI-85-C). That bolt pattern (thirty-six bolts in a 5'-0" square with nine bolts on a side) was used to secure a steel mounting plate to the gun block, the plate replacing the deck piece that originally attached the gun mount to the ship. The steel plate that was secured to these bolts would have received the pedestal mount of the 5-inch/25 gun used at this battery. This mount bolted to the plate with a pattern of large bolts in a circle about 4'-7" in diameter. The table-like concrete feature was cast on top of the gun block and mounting bolts, after the gun, its pedestal mount, and steel plate base were removed. It was built to serve as the base of some other piece of equipment, possibly an antenna.

A 4"-thick concrete slab encircles the gun block. This slab has retaining walls around most of its irregular perimeter, except at the northwest side where they were either removed or not constructed. The retaining walls are typically about 1'-1" thick. The top edges are broken at varying heights above the slab (about 2' to 3'-8") and have numerous pieces of protruding, bent,  $\frac{1}{2}$ "-diameter reinforcing rod which indicates that they were originally taller, perhaps about 4'.

Near the west edge of the 4"-thick concrete slab is a 12"-square depression cast in the concrete. This is about 1'-3" deep, with concrete sides and an earth bottom and a pipe about 4" in diameter opening into the bottom. This appears to be a sump. At the west edge of the 4"-thick slab is a section of metal pipe about 6" to 8" in diameter. This pipe extends under the slab from its edge toward the gun mounting bolts at the center of the gun block. This pipe was likely a conduit for electrical lines, fire control data lines, and possibly compressed air lines for the 5-inch/25 gun.

On the 4"-thick slab are two raised concrete pads with sloped top surfaces which abut the interior side(s) of the retaining wall. The direction of the slope of the pads is tangent to the

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<sup>3</sup> The broken face of the separated concrete arm found in the excavation rubble matches this spalled area at the east side of the table-like feature of cast concrete. Additionally, the imprints of the two protruding  $1\frac{3}{4}$ " bolts were observed in the broken face of the separated concrete arm, indicating its origin.

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rough circumference of the retaining walls. These pads have areas of chipped concrete about 5" wide on their edges nearest the gun block and edges adjoining the retaining wall. These chipped areas indicate where side walls extended up from the pads to support a concrete roof over the sloped pad. This formed a small enclosure holding a metal ready box filled with ammunition for the gun. The openings of the enclosures and ready boxes were oriented toward the lower end of the sloped pad. The pads have a height of about 1'-0" at their highest, sloping to about 5-inch heights at the original opening. Overall footprint dimensions of the pads are typically 4'-0" wide and 3'-6" deep. Accounting for the 5-inch thick side walls, the pads could accommodate a ready ammunition box about 3' wide.

The sloped pad at the south side of the gun emplacement has had a 2'-10" high block of cast concrete constructed adjacent to its lower side. This top surface of this cast block is about 6" higher than the top of the table-like cast concrete feature in the center of the gun emplacement. The 2'-10" high block also has the remains of imbedded metal bolts which have been cut off flush with its top surface. It was likely added to serve as the base for a piece of equipment after the ready ammunition box was removed.

Three steel ready ammunition boxes and five (unattached) steel doors for ready boxes were unearthed at the site of the gun emplacements and command post. These are described in the command center report, HAER No. HI-85-A.

## HISTORICAL CONTEXT

For historical context of this structure see the overview report for this antiaircraft battery, HAER HI-85, U.S. Naval Base, Pearl Harbor, Ford Island 5-Inch Antiaircraft Battery.

## SOURCES

### A. Architectural Drawings:

No drawings of the antiaircraft battery were located for this report.

### B. Early Views:

Aerial photos of Ford Island taken during the war are available at the Hawaii State Archives, Admiral Furlong Collection.

### C. Likely Sources Not Yet Investigated:

Additional records of the Hawaiian Department Engineer are located in Record Group 494, at the National Archives II, College Park, Maryland.

### D. Bibliography:

Bennett, John D. "Oahu's World War Two 5-Inch Naval Antiaircraft Shore Batteries," *The Coast Defense Journal*, pp. 31-67, February 2007.

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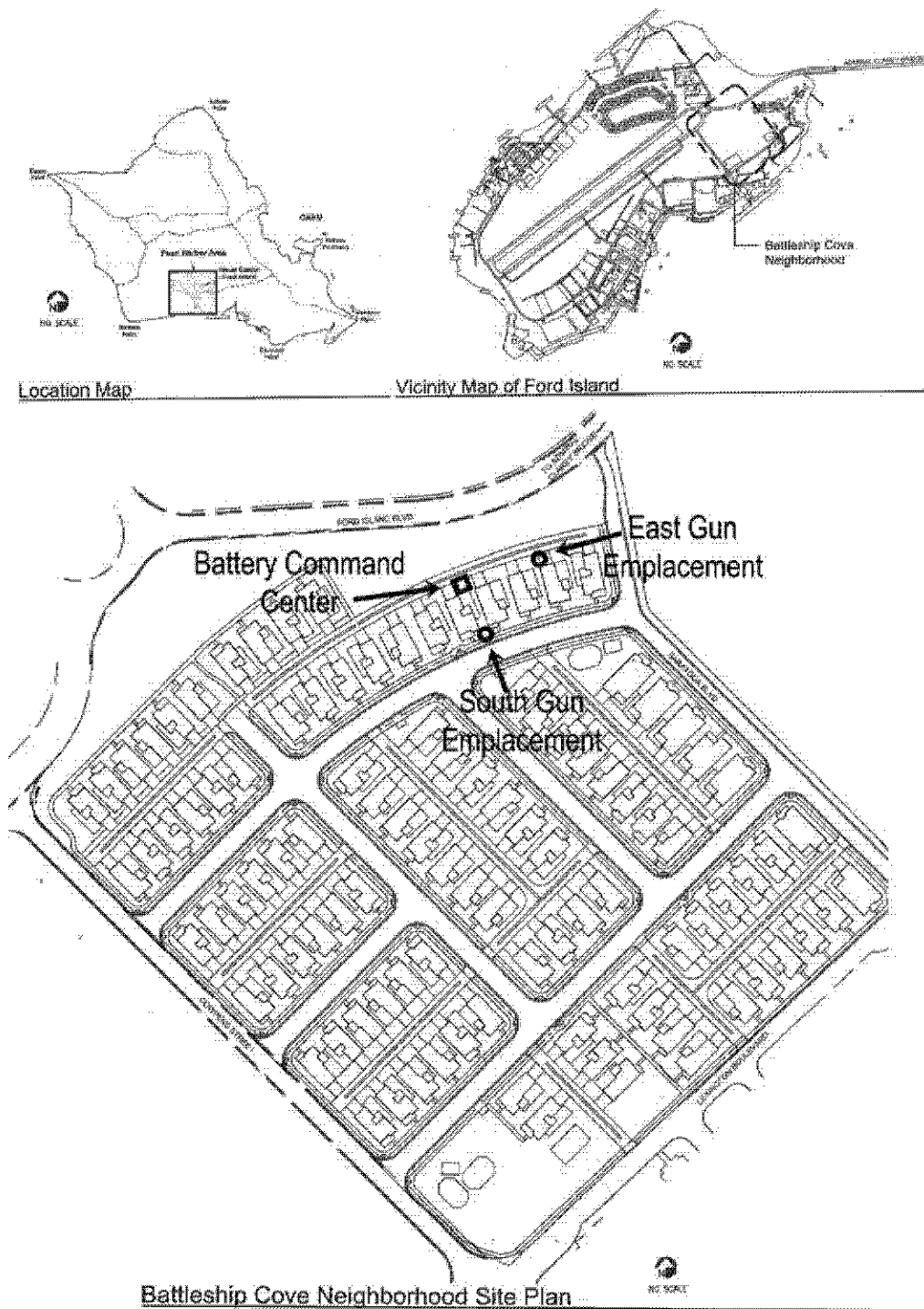
Madsen, Daniel. *Resurrection: Salvaging the Battle Fleet at Pearl Harbor*. Annapolis: Naval Institute Press. 2003.

## PROJECT INFORMATION

This report was prepared to document the structures discovered and unearthed in March and April 2007 at Ford Island, Pearl Harbor National Historic Landmark, during the excavation phase of work to construct new military housing there. After recordation of the discoveries, the underground infrastructure that prompted their discovery was re-routed to avoid the structures and they were re-interred. All artifacts unearthed were placed back into the structures before they were covered. Large-format photography for this report was done in June 2007 by David Franzen of Franzen Photography, Inc. Field work and research were done by Dee Ruzicka and Ann Yoklavich, architectural historians with Mason Architects, Inc., in July and August 2007. John D. Bennett of Oahu, a frequent contributor to *The Coast Defense Journal* and a scholar of coast artillery in Hawaii, was consulted and provided information on the structures and on naval antiaircraft shore batteries. Also, Tony DeGiulian, a naval weapons scholar and author of the website NavWeaps.com provided information regarding 5-inch/25 naval guns, mounts, and ammunition.

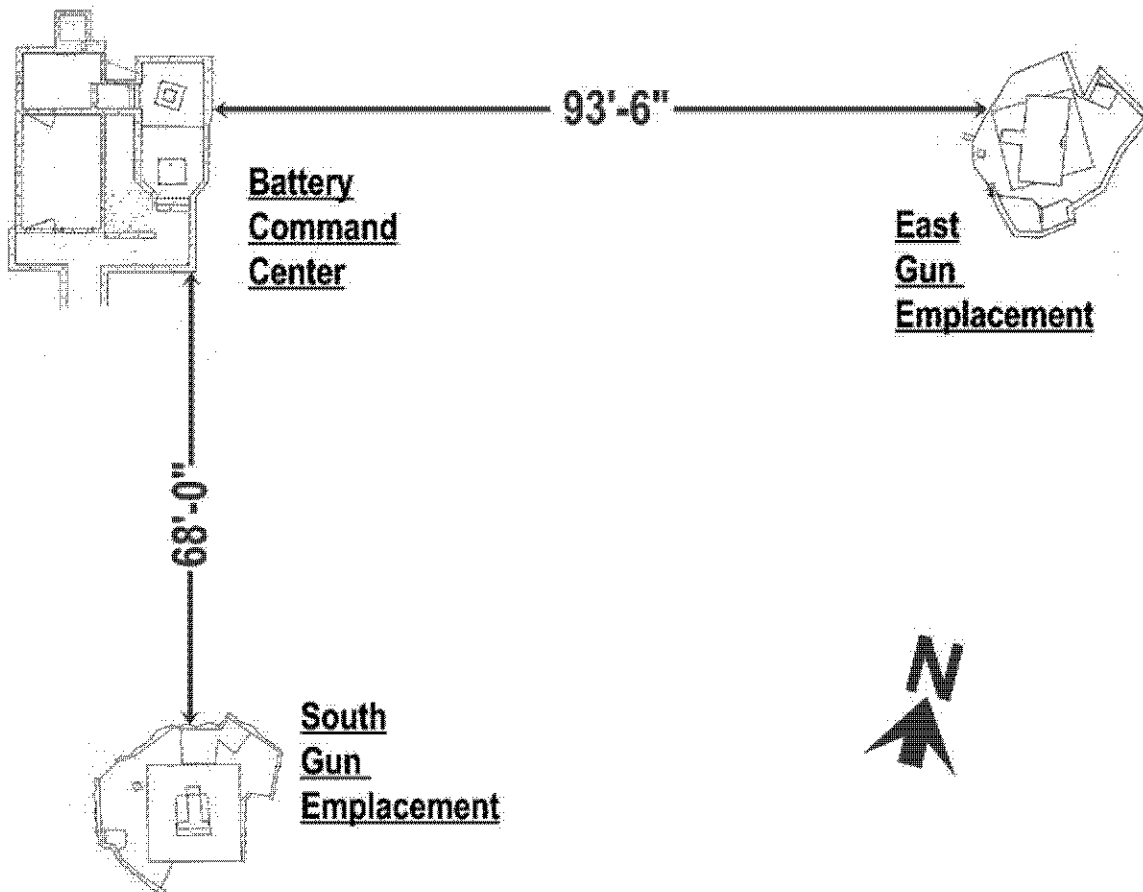
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Location map and site plan.



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Site plan showing the orientation of the three 5-inch antiaircraft battery structures discovered in March and April 2007, with the distances between them. No scale.





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Sketch plan of 5-inch antiaircraft battery east gun emplacement. No scale.

